

NTSB Fuselage Structural Integrity Forum

Panel 4: Manufacturing and Production Quality Assurance

Presented to: National Transportation Safety Board

By: Frank P. Paskiewicz, Acting Deputy Director,
Aircraft Certification Service

Date: September 21, 2011



Federal Aviation
Administration



Authority

- **Title 49 United States Code**
 - § 44704 – (c) Production Certificates –
 - The Administrator shall issue a production certificate authorizing the production of a duplicate of an aircraft, aircraft engine, propeller, or appliance for which a type certificate has been issued when the Administrator finds the duplicate will conform to the certificate
 - § 44713 – The Administrator of the Federal Aviation Administration shall employ inspectors who shall -
 - (1) inspect aircraft, aircraft engines, propellers, and appliances designed for use in air transportation, during manufacture...

Aircraft Certification Service

- **Personnel**

- 251 Inspectors
- 722 Engineers
- 4500+ Designees
 - **52% Engineering**
 - **28% Manufacturing**
 - **20% Airworthiness**

- **Production Approvals**

- 71 Production Certificates
- 1417 Parts Manufacturer Approvals
- 344 Technical Standard Order Approvals
- 130 Organization Delegation Authorization

Directorate	Manufacturing Inspection offices	Aircraft Certification Offices
Transport	5	5
Engine/Propeller	5	3
Small Aircraft	11	5
Rotorcraft	3	3

Regulations and Policy

- **14 CFR Part 21 – Certification Procedures for Products, Articles, and Parts**
 - Design and Production Approvals
 - Amended in October, 2009
- **Certificate Management Policy and Guidance**
 - FAA Order, 8120.2 – Production Approval and Certificate Management
 - FAA Order, 8100.7 – Aircraft Certification Systems Evaluation Program
 - AC 21-43, Production Under 14 CFR Part 21, Subparts F, G, K, and O

New Part 21 Requirements

- **Quality System**

- Establish and maintain a system in place that ensures that each product and article conforms to its approved design and is in a condition for safe operation.
- New quality system requirements effective April 16, 2011
 - Changed to standardize quality systems among production approval holders (PCs, PMAs, and TSOs)
 - Harmonized regulations with foreign authorities (EASA, TCCA)
- The quality system must consist of the 14 required elements

New Part 21 Requirements – cont'd

Record Keeping

- Previous Retention Requirements
 - Retention of records for PMA and critical parts for 2 years
- New Retention Requirements
 - All quality records now 5 years
 - Critical parts records for 10 years
- Future Rule Changes
 - Considering extending the quality record retention requirements

New Part 21 Requirements – cont'd

- **Repair/Rework, Non-conformities (MRBs), etc.**
 - **Enhanced** 21.137(h) - requires procedures for the identification, documentation, evaluation, segregation, and disposition of nonconforming products and articles.
 - **New** Only authorized individuals may make disposition determinations.
 - **New** Discarded products and articles must be rendered unusable. (AC 21-43 appendix E)
- **Statistical Process Control (SPC)**
 - Not required. If the PAH includes SPC in the quality manual, it becomes an approved quality system element.

Aircraft Production Process

- **Design**
 - Type Certification
 - Produce under Type Certificate for 6 months only
 - No approved quality system
 - Significant FAA oversight
 - Witnesses inspections/tests
 - Issues Airworthiness Certificates
- **Production Approval**
 - Production Certificate
 - Must implement the required quality system
 - Additions of models undergo same approval process
- **COS**
 - Certificate Management
 - Oversight of PAH and designees

Cert. Management (Surveillance)

- **The PAH is responsible for:**
 - Ensuring the product or article conforms to type design and is in a condition for safe operation.
- **The FAA is responsible for:**
 - Oversight by verifying the PAH works to approved procedures and maintains compliance to the regulations (certificate management).
- **FAA oversight is conducted by:**
 - Assessing PAH through Risked Based Resource Targeting
 - Conducting Evaluations and Audits
 - Witnessing Tests
 - Overseeing Work of Designees

Certificate Management cont'd

- **Risk-Based Resource Targeting (RBRT)**

- A structured process to support AIR management in determining risk, assigning resources based on that risk, and prioritizing multiple projects
- Assessment performed annually
 - Reassess for significant changes
- Composite Risk Value determined by using:
 - Project criticality
 - Organizational Indicators
 - Technical Indicators
- Total of 34 questions, for example. Is the applicant/PAH ISO 9001 certified or do they have an AS9100 quality system?

Certificate Management cont'd

- **Surveillance Processes**
 - Aircraft Certification Systems Evaluation Program
 - Principal Inspector Evaluations
 - Supplier Control Audits
 - Product Audits